

ARCE

CAL POLY

ARCHITECTURAL ENGINEERING DEPARTMENT | SPRING 2010
COLLEGE OF ARCHITECTURE AND ENVIRONMENTAL DESIGN



Bridge
Work

A Really Good Year

ARCE celebrates its abundant good fortune in 2009-10

What is your definition of a good year?

Mine is Brent Nuttall winning the National Society of Professional Engineers Engineering Educator Award.

It includes ARCE's Christine Cobb being named the Cal Poly Outstanding Staff Member of the Year.

A good year is when five alumni and industry partners step forward to sponsor ARCE labs during trying economic times.

It occurs when 21 firms still show up for Structural Forum when most are not hiring.

A good year is a master's program that grows its involvement of industry partners in the thesis projects.

It includes another ARCE reception at the annual SEAOC convention hosted at the offices of Hope Engineering, with wine contributed by Jerry Lohr's winery.

A good year is marked by the first national competition for ARCE students and sending Emily Carlip and Grace Rose to Kansas City to participate.

A good year is when alumni from 30 years ago return to Cal Poly to re-dedicate their Stick Structure in Poly Canyon being rebuilt by current students.

A good year includes a host of research initiatives and presentations by the faculty members who are able to pursue such creative endeavors while maintaining focus on their primary mission of teaching our students.

A good year is marked by the highest incoming grade-point average of any program at Cal Poly and the graduation of a new class of highly educated structural engineers to serve the citizens of California.

Despite the woes of budget cuts and furloughs, 2009-10 has been a good year, and the ARCE program remains in great shape. I invite you to read further and discover the details of these successes.



ALLEN C. ESTES, DEPARTMENT HEAD

Dean's Message

Tremendous Support

Thank you, alumni and friends, for your commitment

Every year I have more and more occasion to be impressed by the commitment of our alumni and industry partners to the ARCE Department and our College. This year is no exception, with outstanding support for named labs along with the continued commitment of so many of you to scholarships and project support for our students.

In this magazine you will also read about our interdisciplinary labs, faculty and staff achievements and student success. As you read I hope that each of you will take pride in your connection

with this program. We cannot thank you enough for your support, whether it is through time, expert knowledge or financial commitments.

Architectural Engineering plays an important role in our College, and we continue to be impressed by the accomplishment of ARCE alumni. Please stay in touch, and we hope to see you on campus soon.



R. THOMAS JONES, AIA

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On the Cover

Senior ARCE student Megan Hanson is a member of the current Senior Project team that is working to renovate the Bridge House in Poly Canyon. Follow the group's progress at <http://cpbh.info>.

Golden Partnerships

Generous donations
from industry ensure
state-of-the-art facilities
for ARCE students

"Enhancing the future" is how ARCE Department Head Al Estes describes the recent multi-year commitments to ARCE labs. "Our industry partners know that the best business plans think beyond today or even next year, and we have the same vision for our students. With such generous support we can continue to strengthen the program we offer."

Students and faculty are clearly cornerstones of the program's decades of success. The other essentials are facilities and outside support. This year the ARCE Department launched a lab-naming program to unite these two and reinforce the relationship between donors and the students they help. The resulting five-year financial commitment creates a steady funding stream to the department to upgrade the lab space, provide support for equipment and support special student projects.

Ashraf Habibullah, founder and president of Computers and Structures, Inc. (CSI) was a leader in this effort. "We at CSI are very pleased to sponsor the creation of the new ARCE computer lab because we recognize that a modern, well-equipped lab will provide students with the resources they need to be creative and productive professionals, but also help them recognize the power of technology and instill in them a sense of pride in the work they do."

Al Estes says CSI's leadership gift will result in a visible difference this summer. "The old Scarab lab will look new, from carpet to paint to window treatments when the students return in fall. By the time CSI's name goes on the wall you won't



Ashraf Habibullah at the 35th anniversary celebration of CSI. "What better year to give back," he says of CSI's gift to ARCE.



Students work on projects in the Scarab Lab, a space set for renovation and renaming, thanks to CSI's gift.



A gift from ARCE alum and Continental Concrete Structures President Mark Haselton (above) will sponsor F Lab. Experimental labs (right) are the next focus.



Golden

from page 3.

believe the difference between the old and new facility.”

While the link between computers and students is important to Ashraf, he has a broader view of the education of the next generation, hoping that by “encouraging students to develop that sense of pride at the beginning of their careers, we will be making a positive impact on the profession that will last for years to come.”

Mark Haselton (ARCE '63), president of Continental Concrete Structures, found the decision to support the department easy. “You follow your heart.” Mark adds that, “Through the years I found time to re-

visit the College and Poly Canyon to see the neat projects and remember the time we did the concrete sculpture. As time passed, opportunities became available to give back to Cal Poly in the same manner that firms supported our project. It is so satisfying to be able to contribute to the ARCE Department in much the same manner.”

Long-time CAED supporter Simpson Strong-Tie, a world leader in structural connectors, has reinforced their commitment to the College with a lab to be officially dedicated during the Simpson Strong-Tie symposium next spring – six months after the opening of the Simpson Strong-Tie Materials Demonstration Lab, a CAED interdisciplinary facility. Alan Hanson, regional sales manager with

Simpson Strong-Tie and a member of the Dean's Leadership Council, says, “The Simpson Strong-Tie Lab will help promote hands-on learning, particularly timber design, which is lacking at many universities. It will also help contribute to the interdisciplinary learning experience of the College, which we value for the instruction by both experienced practitioners as well traditional academics.”

College Dean R. Thomas Jones is pleased with the breadth of support for the department. “It is rewarding to see such a tremendous commitment to our students, but it is even more rewarding to see that the support comes from alumni, engineering firms, and those who produce materials our engineers will specify in their jobs.”



Alan Hanson (above) says The Simpson Strong-Tie Lab will emphasize in timber design.



Students (right, from left) Devin Daniel, Kevin Chen and Kevin Towers gear up for upgrades that will convert D Lab into The Verco Lab.



Students at Structural Forum visit the Hilti display. The firm sees its partnership with ARCE as an “interface with the university’s best and brightest.”

ARCE’s other generous supporters

Suffolk Construction | “What better way to reinforce the connection between students and industry partners than by bringing their work into our corridors each day,” says Al Estes. “The donation of a flat-panel television by Suffolk allows us to showcase our partner’s professional work on campus.”

Fluor Corporation | The valuable Fluor Student Leadership Fund provides support for student projects, senior projects, competitions, field trips, student participation at national and regional conferences, and two scholarships.

Marcus Oden, senior vice president and general manager with Hilti U.S. West, agrees that exposure to young engineers is a motivating factor in their decision to partner with Cal Poly ARCE. As a worldwide leader in the construction industry focused on power tools, fastening and fire protection products, Hilti has developed ties to faculty of Cal Poly SLO over the past seven years and built a relationship with the students. “During this process, we have had a chance to interface with the university’s best and brightest,” says Marcus. “We hope this next step in our partnership will further our relationships with students and faculty and bring all involved closer to our common goal of building a better future for the design and construction industry.”

Verco has a long-standing relationship with ARCE. Jeff Martin, engineering manager of Verco’s Fremont office, remembers that in the 1990s the first person he hired to work for Verco was a grad from the ARCE program. Since then, the company has participated in various activities including Structural Forums, providing material for lab improvements and senior projects, and has been involved with students in steel design classes. “The recent opportunity to sponsor a design lab is a natural evolution of what we anticipate to be a long-term relationship with ARCE, as well as an expression of our belief in the quality of the Cal Poly program.”

The labs sponsored by Hilti, Simpson Strong-Tie and Verco Decking are promi-

nently located on the main first-floor corridor of the department and are part of Al Estes’ strategy to make clear to every guest that “you are visiting the nation’s premier structural engineering program.” For the students, the strengthened ties with industry will mean that they will have better and more consistent access to the products they will specify throughout their careers.

“When they study timber they can see the connectors and decking materials and gain an immediate understanding. A real world understanding,” say faculty member Kevin Dong.

Altogether, the ARCE facilities are starting to equal the potential of ARCE students.



A Welcome Reality

IPD Studio's multiple disciplines, real projects prepare students for workplace

Collaboration, integration and interdisciplinary are words frequently used to describe the future of the design professions. While there are multiple interdisciplinary experiences available for ARCE students, the most visible opportunity is the Integrated Project Delivery (IPD) Studio run jointly by Architecture, Architectural Engineering, Construction Management and Landscape Architecture.

Each quarter interdisciplinary teams are created within the IPD lab context and are presented with a “real project with real

clients.” During spring quarter this year, the project was the 2010 Natural Talent Design Competition organized by the Salvation Army in partnership with the U.S. Green Building Council. Entrants in the competition were challenged to design an affordable 800-square-foot green home for an elderly client in the Broadmoor, New Orleans neighborhood. Elevating the stakes, the winners will only be announced after the top four entries have been constructed, inhabited and evaluated. The project requires that the students achieve Platinum LEED status with their design,

Students collaborate in the IPD Studio (above), learning architecture, architectural engineering, construction management and landscape architecture skills in the process.

engineer the structure to withstand hurricanes, consider Universal Design, and be ADA-accessible.

This is exactly the kind of project that the IPD Studio has been committed to since its inception: real projects for real clients. While this project is “Small, Green, and Affordable,” in fall quarter the project was green of a different type. The students were

invited by the San Luis Obispo Botanical Garden to design a 60,000-square-foot visitor's center on a steep site with 1,200 parking spaces, all the while remaining sensitive to the core values of the gardens.

Winter-quarter students focused on the renovation of an unreinforced masonry structure in San Luis Obispo: the old Sunny Acres Orphanage, which is the possible new home for the archives of the SLO Historical Society and Archaeological Society.

"The requirement for every ARCE student to have an interdisciplinary experience is a major change to the curriculum," says Department Head Al Estes. "The College has a rich history of bringing the architecture, construction and ARCE disciplines together early in their academic careers, but this College is uniquely poised

to bring the students back together for an upper-division, project-based, studio laboratory experience in their senior year."

There are many practical constraints, pedagogical challenges and logistical considerations to overcome in this course. Al, with faculty members Jill Nelson and Brent Nuttall, presented a paper on the topic in June at the American Society of Engineering Education conference in Louisville, Ky.

There is an ongoing lively pedagogical debate surrounding the creation of a studio environment that has teaching objectives beyond collaboration.

"Each department's students come into the course with different skills sets," notes Jill Nelson. In addition, their department's culture has molded the students' expectations of a learning environment. "In ARCE

we tend to have a large amount of direct instruction, whereas in other departments there is a focus on learning through student exploration. Melding the cultures while mentoring all the students in such a creative setting makes the course an exciting and fulfilling challenge."

There have been many interdisciplinary successes at Cal Poly; however, in most cases, these are small enrollment electives benefitting only a few students. "The difference here is that we are bringing interdisciplinary education to the masses," states Al Estes. "Since there is no other college in the country that has architecture, construction and structural engineering in the same college, nobody else could do this – and it has been hard for us to do it."

Central to the course is the concept that at its conclusion all students will have an understanding of the needs, perspectives and constraints of the other disciplines. In addition, the students will have the basic skills to be successful and contributing members of a professional interdisciplinary team. James Mwangi, the latest ARCE faculty member to join the IPD team, already feels there is great potential, a feeling reflected by his colleagues from the other disciplines.

"For those who hire our graduates," remarks Al Estes, "we hope this experience will result in fewer change orders, more value engineering in the design phase, increased communication and less litigation. I want the Cal Poly ARCE grad to be even more productive on day one."



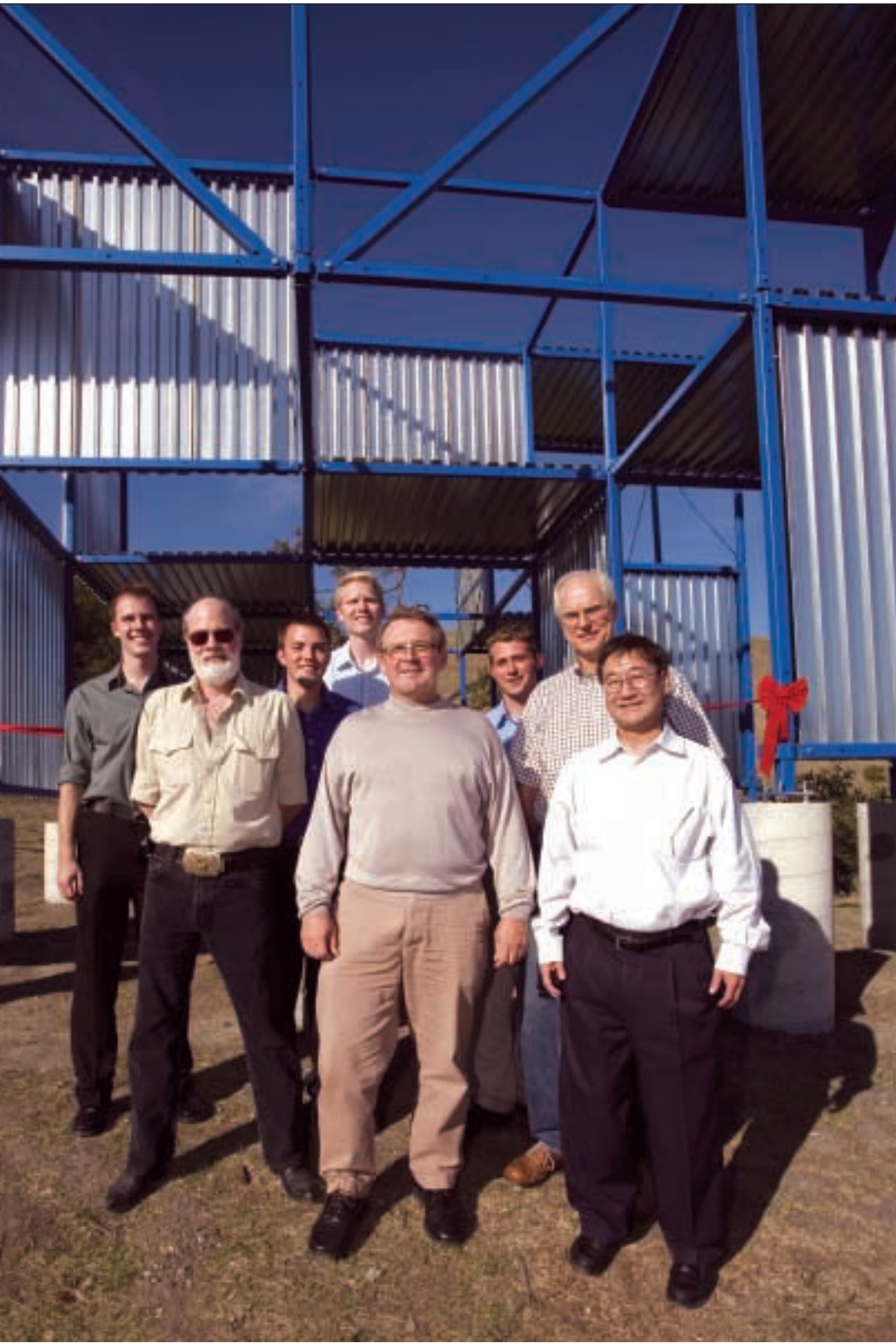
Students Anthony Stahl and Elise Noelle Thelander's design rendering for the Sunny Acres Research Archive (above)

ARCH '99 alumnus Byron Wong (center) visits with IPD faculty members (from left): Greg Starzyk, Gary Clay, Margot McDonald and James Mwangi.

Sticking Around

Among those attending the rededication ceremony last fall were (below, from left): Chase Helgenberger, Brian Gottlieb, Alex Barnes, Blake Roskelley, William Martin, Justin Porter, Ray Bligh and Don Morita

Poly Canyon's Stick Structure stands strong, thanks to ARCE students' recent reinforcements



Thirty-two years separate the students but very little separates them in intent and commitment. In the fall of his senior year, Chase Helgenberger did what every ARCE student has done for over a half century: deliberated about the topic for his senior project. Inspiration came in the form of a trip to Poly Canyon. There he was struck by the Stick Structure, originally designed and built by ARCE students as a senior project in 1977.

The original intention of the structure was to serve as a life-sized structural stability model with elements that could be arranged and assembled in different configurations by future students. Unfortunately, over 30 years of weather had taken a toll on the component parts.

"I was struck by the original intention," Chase recalls. "And I thought it would be incredible to restore it and be part of the Poly Canyon legacy."

His original dream quickly met reality, and Chase decided that a team approach would be the best solution, just as it had been with the original 1977 project. Soon after, ARCE seniors Alex Barnes, Blake Roskelley, Katie Blaesser and Justin Porter joined the effort, with help from '09 ARCE student Lucas Hogan.

The team's senior project had high aspirations to completely renovate the structure using the same structural members, but with a new floor plan and lateral force resisting system. Part of the new design included the use of VERCO metal decking as shear walls and floor diaphragms.

In addition to the building construction, the structure's model frequencies were determined both experimentally

through forced vibration testing and modeling in ETABS and RISA. Additional support came from Hilti, which contributed technical assistance and product for the foundation and anchoring system.

Team member Blake Roskelley says the experience can't really be summed up neatly. "How can we describe all of the challenges and setbacks that we faced as a

team in the deconstruction, member preparation, design, foundation repair and construction?" Lessons learned form another long list: "problem solving, crisis aversion, communication with retailers and industry partners, construction and even statics."

The project received a special conclusion at a formal rededication ceremony on site in Poly Canyon on Oct. 23, 2009, ac-

companied by a student-hosted barbecue. During the ceremony, a dedication plaque was affixed to the structure in the presence of a number of the original project designers: ARCE '77 graduates Bill Martin, Brian Gottlieb, Don Morait and Michelle Pettit. A proud moment for the both teams and original faculty advisor Jake Feldman.

Al Estes admits that senior projects continue to be a controversial curriculum topic among the faculty. "Every few years we get a project that is so magnificent that it begs to be recognized. And the students put in so much more effort than a three-unit course ever deserves; it turned into a labor of love."

He adds, "I can think of no other course in the curriculum where alumni will return 30 years after the fact to support the students who are following in their footsteps."

Learn by doing lives on was the theme of that day!

From left, Peter Zahn, Jim Bluse and Alex Barnes check out the structure.

Students rose to the challenge of the labor-intensive senior project (below).





Brian Planas
in Poly Canyon

Bridge to the Future

Los Angeles native Brian Planas credits his late father with his decision to pursue engineering as a career. “My father was a structural steel detailer, so I was interested in architecture or engineering from the beginning,” says Brian, before confessing to a time when he dreamed of being a musician. He is quick to add that his parents didn’t push him into his final decision. “Well, maybe they nudged a little,” he laughs, perfectly content with his choice to enroll in the Cal Poly ARCE program.

Studying architectural engineering at Cal Poly was also a natural for Brian based on his father’s experience working with Cal Poly alumni. “They were his favorites,” Brian remembers. He coupled that recom-

Brian Planas looks beyond his senior year in ARCE to grad school

mendation with research of his own and applied to Cal Poly as an early admission candidate, then crossed his fingers since he didn’t have a “back up” school.

Now nearing the end of his time on campus, Brian has been busy as president of the SEAOC chapter and serving as resident caretaker in Poly Canyon. While he can’t say enough about SEAOC and the engagement of the chapter members (*see article, page 16*), life in Poly Canyon has also been a rewarding experience. “Amaz-

ing to live in a place that has so many memories for decades of students,” he says.

Brian has come a long way from his first attempts to repair a roof leak with duct tape (which he claims as a success) and is working with five ARCE colleagues to structurally rehabilitate the Bridge House (cover photo) as a senior project. They are still defining the scope of the project but expect it to include installation of braces in the transverse direction of the building, repair to the foundation and restoration of inadequate welds. The group included time for analysis, which started this spring, with plans to continue their work throughout next year.

Brian was also chair of the Trustees of the Architectural Engineering Student Fees



Brian is grill master at a SEAOC barbecue (above).

Brian received the Emanuele Barelli Structural Engineering Scholarship in 2009, presented by Carolyn Barelli (on right). His mother, Adele Planas (in yellow), and Carolyn Barelli's daughter, Maria, added their congratulations.

board, the student committee that recommends how to spend the college based fees collected from students every quarter. Taking his responsibilities seriously, he was often beating on the department head's door with creative recommendations for allocating these funds.

In February, Brian attended the SEAOSC annual job fair and scholarship dinner and was awarded a \$2000 SEAOSC scholarship – the highest value they award. Last year, Brian was the inaugural recipient of the Emanuele Barelli Structural Engineering Scholarship.

With one year left before graduation Brian has his eye clearly on the future and plans to spend the summer in Europe exploring graduate school options. His short

list of graduate schools includes prestigious institutions in England, Germany, Spain and Switzerland. Brian sees a European graduate school experience as a tie to his future as an engineer working on an international level. Serious side of the answer over, Brian smiles and adds, “plus I want to travel.”

After the sudden death of his father last year Brian says life did change for him with an unexpected sense of jumping into an independent adulthood. He has certainly found his center and is ready to meet the next milestone of graduation. Offering advice to the next generation he says: take your time, enjoy yourself, challenge yourself, and take advantage of every opportunity that the college experience gives you.

Recognizing Excellence

The ARCE Department's annual awards event reflects the successes of our students and the generosity of our supporters. Award and scholarship recipients for 2009 are:

Daniel L. Lazzarini | ARCE Academic Excellence - MA

Bing Y. Tsui | ARCE Academic Excellence - BS

Lucas S. Hogan | ARCE Service Award

Ryan R. Swenson | Degenkolb Engineers Scholarship

Brian A. Planas

Emanuele Barelli Structural Engineering Scholarship

Daniel J. Samson, Emily A. Carlip

Englekirk & Sabol Engineers, Inc. Scholarships

Alex L. Barnes, Katie E. Blaesser, Chase W. Helgenberger,

Justin J. Porter, Blake A. Rosekelley

CYS Eugene E. Cole Scholarship

Sinhui E. Chang, Kenneth A. Singh

Fluor Foundation Scholarships

Jonathan N. Lund | Forell/Elsesser Scholarship

Lucas S. Hogan

Fratessa Forbes Wong Senior Project Award

Megan M. Stoner | Hans Mager Scholarship

Erica D. Jacobsen | Herbert E. Collins Scholarship

Alese M. Ashuckian

John A. Martin & Associates Scholarship

Brendan K. McNiff | KNA Senior Project Scholarship

David F. Wollin | kpff Consulting Engineers Scholarship

Jonas H. Houston | Paul F. Fratessa Memorial Endowment

Selinda A. Martinez | RRM Design Group Scholarship

Solomon C. Ives

Simpson Gumpertz & Heger Inc. Scholarship

Dago De La Rosa | Simpson Strong-Tie Scholarship

Lucas S. Hogan | SEOASC Scholarship

Bing Y. Tsui and
Dean R. Thomas Jones





Students (from left) Blake Roskelley, Lisa Aukeman and Margaux Burkholder collaborate on a project.

Masters at Work

Grad students put their all into projects, with the ultimate goal of earning their master's degrees

Exceeding our expectations," is how Department Head Al Estes characterizes the nascent master's program in architectural engineering at Cal Poly. Pleased with the caliber of students who have joined the program, Al is also pleased that the original focus of the program has been maintained.

"The idea from the beginning was to build on Cal Poly's strengths," he says. That strength is real-world industry focus.

Building partnerships between the students and industry partners has evolved more quickly than the department could have hoped and has been an important development in strengthening the program. Students in the blended program transition from undergraduate to graduate in the spring when they enroll in a Research

Methods class. At the same time, they develop a project topic and hopefully connect with an industry partner. Graduate program director Kevin Dong says the tie to industry is critical for most projects.

"We hope they can spend the first summer of graduate school interning with their industry partner," says Kevin. This benefits the projects in multiple ways: students fine-tune their ideas or find a new one.

"There are so many offices that have a specific problem that they wish they had time to research and develop, but the constraints of other project deadlines prohibit it," adds Kevin. "Our students can often take on one of these exciting problems and develop a solution." He estimates that one-third of the current group of students have industry partnerships.

To this, Al Estes adds his thanks for their support. "They give of their time and expertise, which are finite resources," says Al. He hopes that by adding the master's degree, Cal Poly ARCE is also responding to the changing demands of the profession. "The master's program has attracted the interest of some highly technical structural firms that traditionally hire only at the master's degree level."

Current master's student Erica Jacobsen thinks this is very true. "So many of the firms I hope to work for require a master's degree, so it was a natural decision."

Erica's project and partnership formed naturally out of her internship with Degenkolb. Although she didn't have a project in mind, she was focused on the

idea of seismic retrofits. Faculty advisor Graham Archer suggested a forced vibration test on a building prior to and after a retrofit to try to detect the change through testing. Her colleagues at Degenkolb then suggested an actual project to test.

Erica can't say enough about her Degenkolb experience. "I started work for them after I won their scholarship, which included an internship."

Lisa Aukeman has a similar story. Hired by Degenkolb-Oakland after the Structural Forum in her senior year, she discovered her thesis topic with their help. "The principals brainstormed with me and explained why this particular topic affected what they did."

In the end, the most attractive part of the project for Lisa was how closely related it is to an issue in industry and that "a lot of people might be interested in my results when I'm done."

David Carmona has a slightly different variety of industry partner. "I read an article discussing sustainability published by the Structural Engineering Association of Northern California (SEAONC) Sustainability Committee, and my advisor, Jill Nelson, suggested I contact the author."

The co-chairs of the sustainability committee, Erik Kneer and Lindsey Maclise, then suggested a project topic, and David was ready to develop a life-cycle and sustainability analysis of upgrading the structural design of a building from life safety to immediate occupancy.

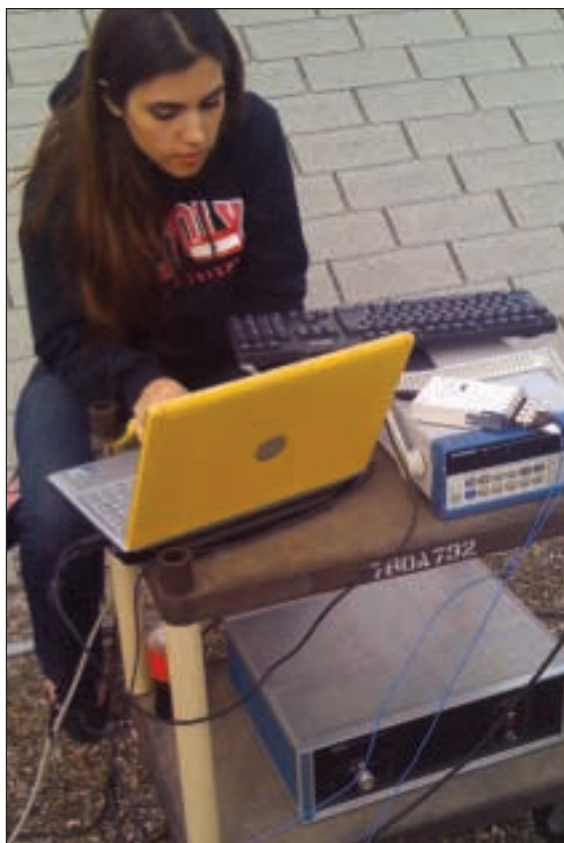
While his advisors are with prestigious engineering firms (Degenkolb and Forell/Elsesser, respectively) he likes that his partnership is rooted in SEAONC.

Looking to the future, Kevin Dong believes that more and more industry partners will come on board, helping the program elevate the project outcomes year after year.

"This is a case where everyone wins. The student gets a master's degree; the industry completes a project that might otherwise not get done; and the ARCE program strengthens its partnership with the industry it serves."



Amy Ransom (above) tests gabion wall samples on the shake table in the Seismic Lab as part of her thesis project to investigate their use for structures in under-developed countries.



Erica Jacobsen's project (left) uses micro-accelerometers and forced vibrations to investigate the dynamic characteristics of buildings.

Test of Skill

ARCE students present their projects at design and construction competitions nationwide

To say ARCE senior Emily Carlip is a fan of student competitions would be an understatement. She won last year's Architecture Engineering Institute (AEI) student competition with her essay proposing an annual student competition.

This year, when the AEI announced the first annual ACSE Charles Pankow Foundation AEI Student Competition, she was "surprised and delighted." And she knew she had to be a competitor.

The 2010 competition theme was the design and construction management of the engineered aspects of a building project. Specifically, a new medical clinic located to support an underserved community within an existing structure on an urban infill site in Tulsa, Okla. Adding to the challenge, students were required to design the space to function as a tornado shelter and triage center after severe weather events. Teams could enter in structural, integrated construction, mechanical and electrical design categories, all highlighting the talents of architectural engineering students across the nation.

Once she decided to enter, Emily next realized that she wanted to "work with an interdisciplinary team to holistically consider how our project could benefit a community." ARCE senior Grace Rose had been with Emily the previous year in Denver when her essay won, and they knew they would be partners on this next project. They were pleased to be

joined by architecture major Peter Trettl and mechanical engineering major David Denio, with ARCE Professor Jim Guthrie as their advisor.

As finalists, the team traveled to Kansas City, Mo. to present at the second AEI National Student Conference. There they presented integrated structural, construction, mechanical and electrical designs. The Cal Poly team placed second in the structural systems category and third in the building integration category. Although appreciative of the recognition, both Emily and Grace hope this spurs future generations of students to enter and win!

While the nature of a competition was appealing, Emily was also interested in the structural implications of designing for a high-winds natural disaster area and comparisons to California seismic standards.

For Grace, the competition was a perfect fit for a senior project. She wanted to not only expand her education beyond the ARCE curriculum but have the chance to work with an interdisciplinary team. A great benefit, she felt, was the ability to "explore the impact of our individual disciplines on each other's design."

Cal Poly also sent a team to the seventh annual Earthquake Engineering Research Institute (EERI) Seismic Design Competition, held this year in San Francisco.

The Cal Poly team designed and built a 1/72-scale, 50-story building from balsa wood. Mathematical models of the building were also created using structural analysis software (both ETABS and MatLab) and were subjected to a number of different earthquake ground motions.

The team presented their designs to a panel of judges drawn from industry, and then the scale models were subjected to



A team of architectural and civil engineering students designed and built a 1/72-scale building from balsa wood (left) for the EERI Seismic Design Competition.



Emily Carlip (right) and Grace Rose received honors for their project (above) at the second AEI National Student Conference in Kansas City, Mo.

three different earthquakes (the same used for the mathematical simulations) on a small shake table.

The competition featured teams from 22 universities in the U.S. and Canada. Cal Poly faculty advisor Abe Lynn says it is an excellent opportunity for the students.

“Our team was a combined group of students from both the architectural and civil engineering programs,” says Abe. “The students had the challenge of a large team and they raised expectations because of a larger work force. It was an excellent experience, combining design, analysis, construction, economics, teamwork and live presentation.”





SEAOC/AEI

Group's forums, field trips and social events offer networking and educational opportunities

SEAOC/AEI members visited a construction site in Vancouver, Canada (above).

A hearty thanks to Hope Engineering for hosting the 2009 alumni reception in San Diego. Al Estes awards the grand door prize to recent graduate Liz Kenyon (right).



"Skylines: Scraping the Sky." A visionary topic adopted by Structural Forum student leaders this year as the theme of their annual event.

"It's always a highlight of the year," says SEAOC President Brian Planas (see article, page 10).

Structural Forum chair (and president-elect of SEAOC) Caelen Ball felt the committee put forward an outstanding line-up of speakers. Farzad Naeim of John A. Martin and Associates spoke about EERI and earthquake testing. Ron Hamburger of Simpson Gumpertz & Heger spoke on the collapse of the World Trade Towers on 9/11, and Leonard Joseph of Thornton Tomasetti spoke about the Shanghai Tower and the Chicago Spire.

The forum banquet in the evening gave students an opportunity to meet, talk and network with representatives from 21 companies. Keynote speaker Charlie Thornton, co-founder of Thornton Tomasetti, spoke about the state of the industry and the career of structural engineering.

"We want to leave guests with something to remember, and I think they won't forget hearing Charlie Thornton soon," says Caelen, adding that the committee works hard to create an event that offers education, networking "and a great time."

While Structural Forum is a highlight, it is only one SEAOC/AEI activity. In February, four emerging leaders in the student

Hey, ARCE alumni: Let's get together in September

The ARCE Department will host an alumni reception on Friday, Sept. 24, at the 2010 SEAOC Conference in Indian Wells.

Look for your invitations in the mail soon and an event announcement in the upcoming SEAOC/AEI Conference program.

We hope to see you there!



SEAOC/AEI members try their hands at curling after the Vancouver Olympics (above).

Structural Forum keynote speaker, Charlie Thornton (left)

chapter – Michael Spangenthal, Laura Rice, Brian Biehl and K.C. Urbani – attended the American Society of Civil Engineers annual Workshop for Student Chapter Leaders in San Diego, with Department Head Al Estes attending as faculty advisor.

“Across industry we hear professionals talk about educating leaders, and this is one way we do that,” says Al. The workshop helps prepare students for leadership positions in ASCE and AEI student engineering chapters. It is held in conjunction with a meeting of ASCE section and branch leaders and the younger member council. Even the ASCE president and executive director attend.

“Leadership of your peers is the most difficult type of leadership,” Al adds. “This workshop helps make all student chapters more successful, and my thanks to the Fluor Corporation whose grant to ARCE helped support it.”

Brian Planas sees all SEAOC activities as important in developing the professional side of the educational experience. “Cal Poly has such a great curriculum – one of the toughest in the country – and an organization like SEAOC offers leadership opportunities and enhances our education. We have everything from social gatherings, like barbecues, to field trips where we visit award-winning projects with the engineers who designed them.”

Brian extends the chapter’s thanks to the professionals who meet with students in their offices and cities, and who come to campus to speak at the weekly SEAOC lunches. SEAOC speakers for 2009-10, in order of appearance, were: Holly Razzano of Degenkolb Engineers; Bill Warren of SESol, Inc.; Darrel Lawver of Weidlinger Associates, Inc.; Mason Walters of Forell/Elssesser Engineers, Inc.; Ken O’Dell of MHP Engineers; Damon Ho of Simpson Strong-Tie; Carole Moore, Cal Poly Career Services; Brad Lowe of Hope Engineers; Blair Pruett of Kern Steel Fabrication; Bruce Danziger of Arup; ARCE Professor James Mwangi; Michelle Kam-Biron of WoodWorks; and Ashraf Habibullah of Computers and Structures, Inc.

Thank you, Forum supporters

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Devin Daniel enjoys a barbecue – one of many SEAOC social events held during the year.

Thank You, Carrie

ARCE lost an important resource last fall to what Department Head Al Estes calls “the inevitable pull of career growth.”

Carrie South (CLA '04) had served in a variety of capacities, beginning as a student assistant in 2001 and ending as administrative assistant in fall 2009 when she became administrative coordinator of scheduling and student support for Agribusiness at Cal Poly.

“When I started as a student I didn’t realize it would turn into a career,” Carrie admits, reminiscing about those she worked with, including Paul Fratessa, Kay Reidel and Abe Lynn. She says she will always appreciate the family atmosphere in ARCE.

“Carrie always represented the viewpoint of the students; she genuinely cared about them and made sure their needs were considered,” adds Al.

Hundreds of students and faculty, in addition to current department administration, have Carrie to thank for the department’s smooth operation. All wish her well in her new role and success in working toward her master’s in agriculture.



Carrie South



Christine Cobb is recognized for her outstanding performance.

Campuswide Kudos

‘Outstanding Staff’ honor is frosting on the cake for Christine Cobb and ARCE

Christine Cobb has been named Cal Poly Outstanding Staff Member of the Year, the first person in the College to receive this prestigious award in over two decades. A campus employee since 1999, Christine is ARCE’s administrative support coordinator.

Given annually since 1972, the award is based on job performance, helping others, relations with students and co-workers, department efficiency, and contributions to the university.

Al Estes comments that, “While the nomination cited major accomplishments such as the 60th anniversary celebration, the move to a new building and back again, and Christine’s excellent performance during a year of budget reductions and furloughs, the more compelling story is how she makes the department a better place on a daily basis.”

Christine will be formally honored at the university convocation in the fall and will have her name added to a plaque in the University Union.

Ed Saliklis designs
an easy-assembly
emergency hut

Gimme Shelter (PRONTO)

The ARCE Department prides itself on faculty members who are experienced engineering professionals and who also have a commitment to teaching and furthering their knowledge through research. Professor Ed Saliklis, Ph.D., P.E., spent parts of this past year utilizing the Cal Poly sabbatical program to both advance and share his research.

In October, Ed presented a peer-reviewed paper at the 50th Anniversary Symposium of the International Association for Shell and Spatial Structures (IASS) in Valencia, Spain. His paper, "Rapidly Assembled Emergency Shelters Made From 'Green' Materials," co-authored by Professor Robert Arens of Cal Poly's Architecture Department, addressed the interdisciplinary project that Ed and Robert have supervised for the past year.

"We were fortunate to receive a \$64,000 grant from the Office of Naval Research," Ed says, explaining that it was necessary for material to test their designs.

"Shelters have received a lot of attention lately," Ed acknowledges, especially in the wake of Haiti's earthquake. He adds that the word, "shelter," embraces multiple needs and is a broad and generic term. "You want to develop a product that can shelter individuals or even resources in the days and weeks after an emergency or disaster, but there is a fine line. There is a danger that it can turn into permanent housing. That is not at all desirable."

As an example, Ed mentions people fleeing war-torn areas. "The governments want them to return to their homelands, and not live permanently in shelter cities."

On the other hand, the shelters have to meet immediate needs following emergencies. This requires fast assembly by untrained workers using very basic tools.

"For our prototype we focused on a shelter that can be built without hand tools or scaffolding. We wanted something light, environmentally responsible, stiff and aesthetically pleasing." And it had to cost around \$200. A tall order!

Also during his sabbatical, Ed presented a paper at the American Society for Engineering Education (ASEE) Global Colloquium in Budapest, Hungary. And with Architecture Professor Marc Neveu, he is researching the engineering, architectural and pedagogical innovations of Myron Goldsmith, a unique figure in the development of tall building design. Their work has been supported by the Canadian Centre for Architecture in Montreal.

Back now and fully immersed in the university schedule, Ed remains committed to the research side of his work. Next steps: He will continue to explore the efficiency and elegance of thin-shell structures both in the classroom and in the lab.

Professor Ed Saliklis (right) and his daughter Ina (JOUR '10) try out the emergency shelter on campus.



John Lawson takes the High Road back to Cal Poly's ARCE

John Lawson (ARCE '83) joined the faculty as an assistant professor in fall quarter 2009. He brings a wealth of experience and continues the tradition of bringing professional engineers into the academic ranks.

John is a licensed structural engineer with 25 years of experience, applying his strong technical knowledge to practical construction solutions. His experience ranges from million-square-foot distribution facilities (tilt-up concrete) to biomedical clean-room manufacturing (steel frame) to multi-unit and custom residential (wood frame). Although they're only a small percentage of his work, structural damage assessments add to the breadth of his experience, including the Oklahoma City bombing disaster and the Northridge Meadows Apartments collapse.

Outside the office, John's work with SEAOC, ICC and ACI have provided insight into building code development and

have led to numerous published works, speaking engagements and honors.

Al Estes is delighted with his latest hire. "John brings an outstanding reputation and a host of industry contacts, especially in Southern California. It seems every time I visit an industry partner, I am told how lucky we are to have him. They're right."

John is thrilled to rejoin the Cal Poly community. He received his undergraduate degree in architectural engineering from Cal Poly before continuing on to Stanford University for his master's in structural engineering.

"I always knew I wanted to return to the Central Coast, and the timing of this position made me think it might be now or never," he says.

John adds that the lure of mountain bike riding in San Luis Obispo County was another factor. "What better place to live, engage with fantastic students and faculty, and share a love of engineering."

John Lawson enjoys a good climb on his mountain bike.



Brent Nuttall

Educator of the Year

That's the NSPE's title for ARCE's Brent Nuttall

ARCE faculty member Brent Nuttall was recently awarded the 2010 National Society of Professional Engineers Engineering Education Award.

The honor recognizes engineering faculty members who have demonstrated the ability to link engineering education with professional practice. The recipients must be licensed and have a tenure-track faculty appointment in an ABET-accredited engineering program.

Brent is a seasoned practitioner who played a pivotal role on major structural engineering projects while working for Nabih Youseff. He brings professional practice into the classroom through his work as chair of the Curriculum Committee and the developer of the new interdisciplinary course for architecture, construction and ARCE students.

He has also created several advanced structural electives in both seismic rehabilitation and cold-formed steel – courses that are not taught anywhere else in the country at the undergraduate level.

Brent will formally be honored in July at the NSPE conference in Orlando, Fla.



Haitian Lessons

Professor James Mwangi shares ARCE knowledge in quake-ravaged country

In the wake of January's devastating earthquake in Haiti, ARCE faculty member James Mwangi, Ph.D., SE arrived on the island to evaluate structures as he had done in Paso Robles as a certified disaster service worker for California Emergency Management Agency (CalEMA). The trip ended differently, with James running seminars for local architects, engineers and contractors hoping to change the culture of construction.

"They used to build light structures, which were destroyed by hurricanes, and NGOs grew tired of aiding the island after every hurricane season." The result was pressure to build heavier structures. Then came the first earthquake in two centuries.

During his two weeks there, James was struck by the hospitality of the Haitians and by their isolation from the rest of North America. "It's a short flight from Miami, but the economy and level of education in the country is an enormous divide."

James teaches a seminar in an improvised classroom (above) and tours the area to evaluate structural damage (right).



Several days into the trip, James and others were called to the Ministry of Public Works to discuss United Nations operations information. The conversation that emerged changed the focus of James' trip. "We started to talk about the next steps. The minister asked me, 'What would you change right now?'" James had an answer: The materials you use for construction.

He had already identified that the limestone often used for gravel and sand was a weak material – weak enough that it was

quarried using rudimentary hand tools. Fortunately, the Haitian government was interested and agreed to close that quarry and turn to other, better quality sites.

In the three-hour training sessions that followed, James focused on fundamental education about the causes and responses to earthquakes, using the peeled shell of a hard-boiled egg to illustrate plate movement. Then he turned to correcting basic structural design and construction flaws, including correcting stirrup bending and illustrating the proper preparation of brick and mortar. "Too many structures were built of hot bricks that leached the water from the mortar as soon as they were laid." Another common flaw was the improper construction of confined masonry.

Through lectures, handout illustrations and site visits, James hopes that they started to make a difference. He plans to spend this upcoming academic year on sabbatical in Haiti.



Degenkolb ENGINEERS

Firm's focus is on protecting lives with superior engineering

Lifelong learning is at the heart of Degenkolb Engineers' values as a company and is a natural extension of co-founder Henry Degenkolb's impact on the profession. Henry moved to California just a few years after the 1933 Long Beach earthquake and was an important part of the movement to rethink earthquake protection in the state.

Regarded by many as the grandfather of earthquake engineering, Henry was an early leader in embracing an interdisciplinary approach to the study of earthquakes, embracing geophysics as well as the engineering sciences in his quest to understand, predict, and mitigate the impact of earthquakes on the built environment. This is a legacy that lives on in the firm today, decades after Henry's passing.

This year Degenkolb Engineers celebrates 70 years as a company that has stayed true to its original mission, even as it has expanded its offices up and down the West Coast and its projects around the world. Over these years the firm has

Degenkolb designed a concrete structure to provide high seismic performance for the House Ear Institute (above).

developed a close relationship with Cal Poly architectural engineering, and several members of the firm currently serve as formal mentors to ARCE graduate students and senior projects.

"These relationships are at the heart of who we are as a department," says Department Head Al Estes. "Right now the relationship with Degenkolb has never been stronger, with recent ARCE grads Kate Caffaro, Adam Azofeifa and Taka Yokoyama all working at Degenkolb. Master's student Erica Jacobson just re-



Clockwise, from top:
Engineers inspect and evaluate damage in Haiti.

Degenkolb designed the concrete and steel seismic strengthening scheme for the Walt Disney Family Museum so that it does not alter the historic brick facade.

© CESAR RUBIO

Degenkolb Principal
Jorn Halle



ceived an offer and current student Emily Carlip is interning there this summer. They're getting our top people." In addition, a former ARCE faculty member is now with Degenkolb and current faculty member Abe Lynn took difference in pay leave to work there two years ago.

Not surprisingly, Degenkolb prides itself on its ongoing commitment to seismic research and engineering techniques. The firm has piloted new ways to protect communities by advancing, developing and writing seismic standards and building codes; researching and analyzing how building frames, materials and systems respond to earthquakes; and utilizing the

most advanced technologies available for protecting existing buildings.

Today, Degenkolb engineers are often among the first on the ground after a major seismic event. Recently they returned from exploration trips to Baja, Haiti and Chile, continuing the firm's commitment to life-long learning. "It is an extension of learn by doing that many of us experienced at Cal Poly," says Degenkolb Principal and ARCE Advisory Board member Jorn Halle. "After a major seismic event, we see first hand the results of poor engineering."

When Degenkolb engineer Alvaro Celestino learned of the Feb. 27 earthquake in Chile, he thought of friends and family.

Then he reminded himself that building codes in Chile rival those in California.

"When people ask what we do, most engineers say build buildings or bridges, but what we really do is keep people safe," says Halle. "I hope that students studying engineering realize that and take pride in their contribution to society. Every life protected through good engineering is a life that won't be a post-quake statistic."

Visit www.degenkolb.com for more information about Degenkolb.



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A Concrete **LEARNING** Experience

The sidewalk is as good a place as any to study, as dedicated ARCE student Amy Ransom demonstrates.